

# Intra-operative Bronchospasm in a Patient Who was Scheduled for Emergency Caesarean Section under Spinal Anaesthesia

R. MUDARADDI, S. KINTHALA, U. BYADARAHALLI RAMACHANDRA

## ABSTRACT

An asthmatic attack during spinal anaesthesia is uncommon. It is a known fact that regional anaesthesia is the best option for asthmatic patients. The incidence of bronchospasm under spinal anaesthesia is high, during high spinal anaesthesia, which is infrequent. The incidence of episodes of bronchospasm are relatively higher in general anaesthesia than in spinal anaesthesia.

The episodes of asthmatic attack during anaesthesia are decreasing due to the improved medical care. The prompt recognition of the episode and the timely treatment prevents the life threatening complications. Here, we are describing a case of an asthmatic attack during caesarean section under spinal anaesthesia.

**Key Words:** Bronchospasm, Fentanyl, Spinal Anaesthesia

## INTRODUCTION

Bronchospasm, the clinical feature of exacerbated, underlying airway hyperreactivity, has the potential to become an anaesthetic disaster if it is not recognized [1]. Whatever the clinical circumstances, different triggers are identified in the peri-operative bronchospasm with asthma, among which a chronic inflammation of the airway is frequently involved. Spinal anaesthesia is the choice in caesarean section due to its decreased risk of failed intubation, avoidance of the gastric contents, avoidance of the depressant effects of the drugs on the foetus and the ability of the mother to remain awake and to enjoy the birthing experience. The use of spinal anaesthesia has dramatically increased in view of all these advantages, as compared to general anaesthesia [2]. It has been studied that intra-theal fentanyl provides a good quality of anaesthesia when it is used with Hyperbaric Bupivacaine 0.5%, without causing respiratory depression. Here, we are reporting a case of bronchospasm which was caused by a high sensory blockade due to intra-theal fentanyl with a review of the literature.

## CASE REPORT

A 20-year primigravida who had completed 41 weeks of pregnancy, who was a known case of asthma, presented for emergency caesarean section due to failure to progress and post datism. She received oxytocin infusion in the labour room for augmentation. The patient was a known case bronchial asthma from the past 2 years and the last episode of the asthmatic attack was 1 year back. She had a history of allergy to dust. She was prescribed the mixture of Budenoside and Formeterol inhaler after asthma was diagnosed by the physician. The systemic examination was unremarkable. The laboratory reports showed a haemoglobin value of 12.2g/dl. The patient received a dose of inj. pantoprazole 40mg and metoclopramide 10mg before she was shifted to the operating room. The decision to induce the patient with spinal anaesthesia was made after explaining the procedure to the patient.

In the operating room, standard anaesthesia monitoring was initiated after checking the electrocardiogram (ECG), non invasive blood pressure (NIBP), and the pulseoximetry (SpO<sub>2</sub>) reports. The blood pressure was 130/74 mmHg and the heart rate was 90/min. The oxygen saturation was 98% on room air. The patient already had an 18G intravenous access with 500ml normal saline infusion. She was preloaded with the same 500ml saline. Spinal anaesthesia with a mixture of 10mg Of bupivacaine 0.5% and 25mcg fentanyl was given in the L<sub>2</sub>-L<sub>3</sub> space by using a 27G Whitacre needle, by taking aseptic precautions, with the patient in the sitting position. The total volume of the drug was 2.5ml. After achieving a sensory level upto T<sub>4</sub>, the caesarean section was started. The patient received inj. cefazolin 1gm and metronidazole 500mg as prophylactic antibiotics. The hypotension which was caused by the spinal anaesthesia was treated with inj.ephedrine 5mg IV A live male baby was delivered, which was uneventful. An infusion of 40 units of oxytocin in a litre of normal saline was started after the delivery. The duration of the procedure from the skin incision to the delivery was 25 minutes. 10 min after the delivery, the patient started complaining of shortness of breath, her heart rate went upto 130/min, her oxygen saturation was 99%, and her lowest blood pressure which was recorded was 84/40 mmHg. Auscultation of the chest revealed bilateral extensive wheezes. The diagnosis of an asthmatic attack was made. The patient received 100% oxygen by mask and 12mg of inj.dexamethasone intravenously. Then, the patient was started on nebulization with a mixture of Ipratropium bromide 0.5mg and salbutamol 3.01 mg by using a venturi mask. The patient was relieved of the asthmatic attack after 15min. Her blood pressure and her oxygen saturation were normal. The physical examination of the skin and the mucosa was normal. The arterial blood gas was normal.(P<sub>H</sub>-7.415, P<sub>co2</sub>-26.6, P<sub>o2</sub>-156.9, HCO<sub>3</sub>-16.7, BE--6.1, O<sub>2</sub>saturation-99.5%). The surgery lasted for 1 hour and the patient was shifted to the recovery room. The patient was comfortable and she was advised to continue using her inhaler. A chest X-ray which was done post operatively was

normal. The consent for the publication of this article was obtained from the patient.

## DISCUSSION

The sudden onset of bronchospasm in a patient with a history of asthma during general anaesthesia is an anticipated problem at any stage of an anaesthetic course, but a prompt recognition and treatment are crucial for an uneventful outcome [1]. The onset of an asthmatic attack or bronchospasm is a rare event under spinal anaesthesia, as there is no airway manipulation. The incidence of asthma is increasing worldwide and the mortality is decreasing because of improved medical care [3]. Although the incidence of severe peri-operative bronchospasm is relatively low in asthmatics, when it does occur, it may be life threatening [3].

The bronchospasm which is encountered during the peri-operative period under spinal anaesthesia has various causes to be ruled out before its diagnosis is established. In our patient, an allergic reaction to the drugs which were administered was ruled out, as there were no features of skin erythema, hypotension or oxygen desaturation [3]. The bronchospasm which could be caused by an anaphylactic reaction to oxytocin was unlikely, as the patient had labour augmentation with oxytocin prior to the surgery [4].

The event which occurred after the delivery of the baby coincided with the peak action of the spinal anaesthesia. The triggering factors for the asthmatic attack in our patient could have been anxiety or sensory blockade upto T<sub>4</sub>, which could have been caused by the spinal anaesthesia. The patient was comfortable after the delivery and anxiety was unlikely. The addition of intra-theal fentanyl to hyperbaric bupivacaine in parturients who underwent caesarean section was found to improve the quality of the anaesthesia, without producing significant side effects, but the level of the sensory blockade which was produced by intra-theal fentanyl was significantly higher than that which was seen in the control group [5].

The autonomic nervous system controls the normal calibre of the bronchi [6]. The principal function of the sympathetic (T<sub>2</sub>-T<sub>4</sub>) supply to the lung is bronchodilation, while the vagi act as stretch receptors [7]. An asthmatic patient will have an abnormal autonomic nervous system, which is responsible for the airway hyper reactivity. The stimulation of the para-sympathetic nervous system is implicated in the pathogenesis of asthma [8]. A thoracic sympathetic blockade which is made by spinal anaesthesia might trigger an asthmatic attack by influencing the cholinergic ganglia of the lung and the

pulmonary blood flow [9] and by releasing inflammatory mediators. In our case, even though the patient had no asthmatic attack in the past 1 year, she became susceptible to the bronchospasm under spinal anaesthesia. Spinal anaesthesia is considered to be the safest form of anaesthesia in patients with hyperreactive airways, but still the patients can get asthmatic attack due to various causes which have been described above. It is always better to anticipate the problem, especially when the sensory blockade under spinal anaesthesia is between T<sub>2</sub>-T<sub>4</sub> in the susceptible patients. The treatment includes the supplementation of oxygen and intravenous steroids and nebulization with bronchodilators. The prophylactic administration of moisturized oxygen and intravenous steroids was shown to be beneficial in preventing asthmatic attacks during surgery [10].

In conclusion, even though intra-theal fentanyl is safe, we should always keep in mind the high sensory level which is caused by this additive and we should be vigilant in order to anticipate complications in susceptible asthmatic patients.

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### AUTHOR(S):

1. Dr. R. Mudaraddi
2. Dr. S. Kinthala
3. Dr. U. Byadarahalli Ramachandra

### PARTICULARS OF CONTRIBUTORS:

1. Senior registrar, Department of Anesthesiology and Surgical Intensive Care, Queen Elizabeth Hospital Barbados.
2. Senior registrar, Department of Anesthesiology and Surgical Intensive Care, Queen Elizabeth Hospital Barbados.
3. Senior registrar, Department of Anesthesiology and Surgical Intensive Care, Queen Elizabeth Hospital Barbados.

### NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Rajashekar Mudaraddi MD., Senior Registrar,  
Department of Anesthesiology and Surgical Intensive care.  
Queen Elizabeth Hospital Barbados.  
E-mail: raj123doc@yahoo.co.in  
Fax: +12464274423

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